

The genus *Diomorus* Walker, with a new key to the European species (Hymenoptera: Torymidae)

M. W. R. DE V. GRAHAM

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Abstract: The status of the genus *Diomorus* Walker is discussed and characters for distinguishing it more clearly from *Torymus* Dalman are proposed. A new key to the three European species is provided.

5 Salisbury Crescent, Oxford OX2 7TJ, United Kingdom.

Introduction

The status of *Diomorus* Walker, 1834 as a valid genus is retained provisionally, although recent workers have realised that its distinction from *Torymus* Dalman, 1820 may be a matter of opinion. Already Walker (1874) remarked 'D. *armatus*, is the type of the genus *Diomorus*, which was perhaps unadvisedly [sic] separated by me from *Callimome* [= *Torymus*], the dentate hind femora being the only character which distinguishes it'. Grissell (1976) regarded *Diomorus* as one of several genera which '... appear distinct from *Torymus* but combine most of the characters found in this genus'. In his key to Nearctic genera of Toryminae Grissell (1976) distinguished *Diomorus* from *Torymus* Dalman and *Allotorymus* Huber, 1927 by the following characters: 'Frenum distinct, a narrow band confined to apical $\frac{1}{8}$ of scutellum; propodeum completely roughly sculptured and hindfemur with distinct tooth (fig. 62) (parasitic on aculeate Hymenoptera)'.

Unfortunately two of the above characters do not apply to the type-species *Diomorus nobilis* Walker, 1834 (= *armatus* Boheman, 1834). This species has a very large frenum the length of which is at least 0.38 the total length of the scutellum, whilst the propodeum is extensively smooth, with a few longitudinal striolae on each side of the median line. On the other hand a strong tooth is present on the hind femur of the Nearctic *Torymus texanus* (Hoffmeyer), whilst a small or rudimentary

tooth occurs in the Nearctic *T. atheatus* Grissell, *T. denticulatus* (Breland), *T. fullawayi* (Huber) and *T. subcalifornicus* Grissell, also in some specimens of the European *T. (Syntomaspis) fastuosus* Boheman. The feature of parasitism by *Diomorus* on aculeate Hymenoptera appears to be a valid biological distinction separating it from *Torymus*.

The three European species of *Diomorus* have in common a strong tooth on the hind femur; however, in other respects they do not form a homogeneous entity, as will be evident even from the characters given in my key to species below. The type-species *D. nobilis* differs considerably from the other two and is very close in most respects to *Torymus* (some of the *Syntomaspis*-group). The other two species form in my opinion a distinct species-group within *Diomorus* which agrees more closely with Grissell's definition of the genus quoted above. I should note here that *Syntomaspis* Förster, 1856, *Callimomus* Thomson, 1876, and *Lioterphus* Thomson, 1876, are currently regarded as no more than species-groups, or, at most, subgenera of *Torymus* Dalman. Consequently the only genera of the subfamily Toryminae represented in Europe are *Diomorus* and *Torymus*.

Several characters mentioned in the keys below have not been noticed before. In my key to species the following abbreviations are used: M: marginal vein of forewing; PM: postmarginal vein; ST: stigmal vein.

Key distinguishing *Diomorus* and *Torymus*

- 1. Vertex of head with several strong transverse wrinkles or striae, between which are distinct piliferous punctures; frons with similar sculpture. Head in dorsal view very strongly transverse, 2.25-2.5 times as broad as long, with temples converging very strongly and straight or virtually so. Hind femora with a strong ventral subapical tooth. Sculpture of mesoscutum, and scutellum except the frenum, strong (especially in *D. cupreus* and *D. calcaratus*); scutellum with a smooth anteriorly delimited frenum. Propodeum often with very coarse rugose or areolate-rugose sculpture (though mainly smooth in the type-species). Antennal scape short, not nearly reaching level of median ocellus. Parasites of aculeate Hymenoptera living in twigs or stems (Sphecidae, some Apidae) *Diomorus*
- Vertex of head nearly always without trace of transverse wrinkles or striae, rarely with some fine and weak striae; frons with very fine reticulate or alutaceous sculpture, with or without piliferous punctures. Head in European species almost always less transverse than in *Diomorus*; temples often converging less strongly, or rounded. Hind femora without a ventral subapical tooth except in *T. texanus* in which it is strong, and in a few other species that have a weak tooth. Sculpture of mesoscutum and scutellum very rarely as strong as in *Diomorus*; scutellum with or without a frenum. Propodeum most often with weak sculpture or nearly smooth, occasionally with stronger sculpture but not coarsely rugose. Antennal scape sometimes reaching or exceeding level of median ocellus. Mainly parasites of insects living in galls, especially Hymenoptera (Cynipidae) and Diptera (Cecidomyiidae), occasionally Diptera (Tephritidae); rarely of Coleoptera *Torymus*

- cept for a row of punctures along the base and 1 to 3 fine longitudinal striolae on each side of the median line. Forewing: PM 3.3-3.8 times length of ST. Scutellar frenum occupying 0.38-0.45 of total length of scutellum. Mesolcus (median longitudinal furrow of mesosternum) simple. Malar space 0.2-0.3 length of eye. (Ovipositor sheaths nearly or about as long as body and 2.5-3 times length of hind tibia; hind coxae bare dorsally at base, their external surface reticulate) *armatus* (Boheman)
- Propodeum between spiracles areolate-rugose or rugose. Forewing: PM at most about twice length of ST, usually less. Scutellar frenum 0.24-0.29 of total length of scutellum. Mesolcus punctate. Malar space 0.29-0.43 length of eye 2
- 2. Ovipositor sheaths slightly longer than gaster and 1.75-2 times length of hind tibia. Hind coxae dorsally with a thick band of pilosity in the basal half; external surface of hind coxae reticulate. Antenna with pedicellus plus flagellum about equal to breadth of head; funicular segments (except sometimes the first) slightly broader than long. Malar space 0.41-0.43 length of eye. Head and thorax coppery-green to coppery *cupreus* (Spinola)
- Ovipositor sheaths as long as or slightly longer than body and about 3 times length of hind tibia. Hind coxae dorsally bare, their external surface extensively smooth. Antenna with pedicellus plus flagellum 1.2-1.3 times breadth of head; funicular segments quadrate, or segments 1 and 2 slightly longer than broad. Malar space 0.29-0.34 length of eye. Head and thorax blue to violet, sometimes partly or wholly greenish, or greenish-blue with some violet parts *calcaratus* (Nees)

Males may be distinguished by some of the characters given above for females: sculpture of propodeum, relative length of PM vein, structure of mesolcus, relative lengths of scutellar frenum and of malar space, colour of body.

Key to European species of *Diomorus* (females)

- 1. Propodeum between spiracles smooth ex-

Comments on some extralimital species

The Indo-Australian *D. orientalis* Masi, 1926 and the North American *D. zabriskiei* Cresson, 1878 conform to my diagnosis of *Diomorus* above. The former seems more nearly related to *D. armatus*, the latter resembles *D. cupreus* and *D. calcaratus* in many respects. I have not seen *D. aiolomorphi* Kamijo, 1964 which is a parasite of *Aiolomorpha rhopaloides* Walker (Chalcidoidea: Eurytomidae) and is said to have a long antennal scape, in these respects disagreeing with my diagnosis of *Diomorus*. Also *D. spinosus* Kamijo, 1979 which is said to have nearly smooth frons and vertex, antennal scape reaching median ocellus, seems likely to belong to *Torymus* (near the *Syntomaspis* group).

Biology and distribution of European species

D. armatus

Widely distributed in Europe but more frequent in north (including The Netherlands and Britain); rare in south and possibly absent from some low-altitude areas of Mediterranean. Parasite of some Hymenoptera Sphecidae (e.g., *Trypoxylon* sp.) in stems of *Rubus* and other plants.

D. cupreus

Mainly southern and Central Europe, and Central Asia, but extends to northern France and The Netherlands. Like *armatus*, a parasite of Sphecidae in stems of *Rubus*, *Phragmites* and *Linaria*; also reared from *Osmia* sp. (Apidae).

D. calcaratus

Widely distributed over continental Europe, including The Netherlands, but not found in Britain. Also a parasite of Sphecidae including *Stigmus solskyi* A. Morawitz, *Ectemnius rubi-*

cola (Dufour & Perris) and *Pemphredon* sp. in stems of *Rubus* and other plants. It has also been obtained from old galls of *Andricus kollari* (Hartig) (Cynipidae) which had probably been used for nesting purposes by some species of Sphecidae.

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